



# SUMMARY OF ACTIONS AND RECOMMENDATIONS TOVS/ATOVS IN CLIMATE

<sup>1</sup>Jörg Schulz, <sup>2</sup>Peter Thorne, <sup>3</sup>Lei Shi, <sup>3</sup>John Bates,  
<sup>4</sup>Claudia Stubenrauch, <sup>2</sup>Viju John

<sup>1</sup>Deutscher Wetterdienst

<sup>2</sup>UK MetOffice

<sup>3</sup>NOAA

<sup>4</sup>LMD



# Introduction



- There have been 16 recommendations and 10 specific actions from the ITSC-15
- Recommendations (10-12) concerned with NPOESS de- and re-manifestation will be covered on Friday in an extra talk
- Recommendations and actions (5, 6) related to in situ networks are covered in Peter's talk on GRUAN.
- Reanalysis recommendations have been passed to WCRP/AOPC working group on observations for reanalysis (WOAP)
- This talk focuses on:
  - development of WG web site
  - New sensors – monitoring of CH<sub>4</sub>, CO, CO<sub>2</sub>
  - development of GSICS and R/SSC-CM



# Remaining Action Summary

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- **Action Climate-1:** Set up WG web site – done.
- **Action Climate-2:** Addition of links to GEWEX assessments – links established, can be put on site.
- **Action Climate-3:** John Bates to make available information relating to the status of the NPOESS project as and when publicly available - link to the NPOESS project is added.
- **Action Climate-4:** available information on future plans of satellite agencies and/or past actions helping in the interpretation of data streams - regular updates needed - WG Web site has links to several current and future satellites and activities. However, the links will need updates by the group.



# Remaining Action Summary



- **Action Climate-7:** updated knowledge on instrument characteristics Web links on the WG Web sites - The ITWG RT WG provided web links on satellite instrument characteristics for NOAA POES ATOVS and AVHRR, GOES, Meteosat, MetOp IASI, EOS MODIS and AIRS, and GMS-5. A link to MetOp ATOVS and AVHRR SRFs is still yet to be provided.
- **Action Climate-8:** ITWG Climate Group to post any information on satellite data reprocessing and sensor metadata updates on the ITWG Web site. - Some satellite data reprocessing and sensor information has been posted to the WG Web site – more to come.
- **Action Climate-10:** ITWG members to circulate NRT planned IASI processing activities for climate (e.g., M. McCarthy for Met Office plans) - UK Met Office has started the Had-IR project to archive IASI data using 1 out of 4 pixels but maintaining full spectral resolution. Plan will be posted to the WG web site.



### International TOVS/ATOVS Working Group

#### Sub Group for use of TOVS/ATOVS in Climate Studies

Working Group Members: J. Bates (Co-Chair NCDC), C. Stubenrauch (Co-Chair), S. Ackerman, M. Goldberg, B. Lapeta, M. McCarthy, C. Pierangelo, A. Reale, P. Schlüssel, J. Schulz, C. Shi, L. Shi, B. J. Sohn, P. Thorne, H. Zhang

### ITWG Home

#### The NOAA Scientific Data Stewardship System



Assisting agencies, organizations and individuals with climate change and measurements.



## About the working group

Since the first International TOVS Study Conference (ITSC) held in Austria (1983), the ITSCs significantly evolved and formed numerous working groups and subgroups. The **Climate Working Sub-Group (CWSG)** now has access to data records in excess of 25 years. Accordingly, the objective of this working sub-group is continuing to improve the management, integrity, quantity, quality and collaboration of climate products as more centers fall in to support Climate Data Record (CDR) production in operations around the world.

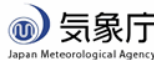
The ability to access and share both historical, current and planned climate products and data (both raw and meta-data) has become an essential requirement that empowers leaders to make informed, confident decisions based upon solid and credible recommendations from subject matter experts.

## Working group activities

### Recent updates

#### Climate Data Record (CDR) Measurement Maturity Index

As the data records from satellites have become longer and the science of applying these data to climate problems has evolved, best practices for compiling CDRs have emerged. The objectives in compiling these best practices into an assessment model has arisen in order to:



Comprehensive Large Array-data Stewardship System



JAXA promotes consistent activities, from basic research to technology development and utilization.

### Email the CWSG Co-chairs

- [J. Bates \(NCDC\)](#)
- [C. Stubenrauch](#)
- [S. Ackerman](#)
- [M. Goldberg](#)

1. Reduce difficulty and confusion in the community about what attributes are important in climate data records,
2. Produce an easily understood way of identifying maturity of data products and science data stewardship approaches, and
3. Help identify areas needing improvement.

In an effort to capture these best practices and assess the maturity of various CDRs, three dimensions for assessing the maturity of a CDR have initially been proposed; scientific maturity, preservation maturity, and societal benefits. The particular maturity level is assessed by defining the set of key process areas and the level of best practices that characterize each area. The result is a score ranging from 1 (very low) to 5 (very high) that can be used to provide a rating of the total maturity of a specific climate data record. **Essential Climate Variable (ECV) Societal Impact** and **ECV IPCC Impact** Indices in *HTML* format are anticipated to be available for review, consideration and input from subject matter experts in the near future.

## ITSC working group reports

At every ITSC the group meets to discuss developments and issues arising in the areas of interest to the working group, listed above. PDF copies of the resulting reports will be provided here.

### Reanalysis and Satellite Sensor Information:

[The Japan Meteorological Agency \(JMA\)](#) is currently working on action Climate-8 and ITSC-15. JMA will post any information on reanalysis and satellite-sensor to include metadata updates on the ITWG web site. Dr. Masami Sakamoto has completed work on geometric error lists and associated documentation to include compilation of TBB quality lists. An [Error List Production](#) in accordance with (IAW) the following recommendations in ITSC-15 will be completed:

- Recommendation Climate-4: Reanalysis groups should seek to work with the operational satellite climate centres on the optimal calibration and processing of archived data sets. Additionally, the Reanalysis Groups should send back to the relative operational centre any Meta Data obtained during or after the reanalysis.
- Recommendation Climate-7: Reprocessing and Reanalysis Centres to

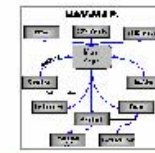


[Return to Satellite Data Main Page](#)

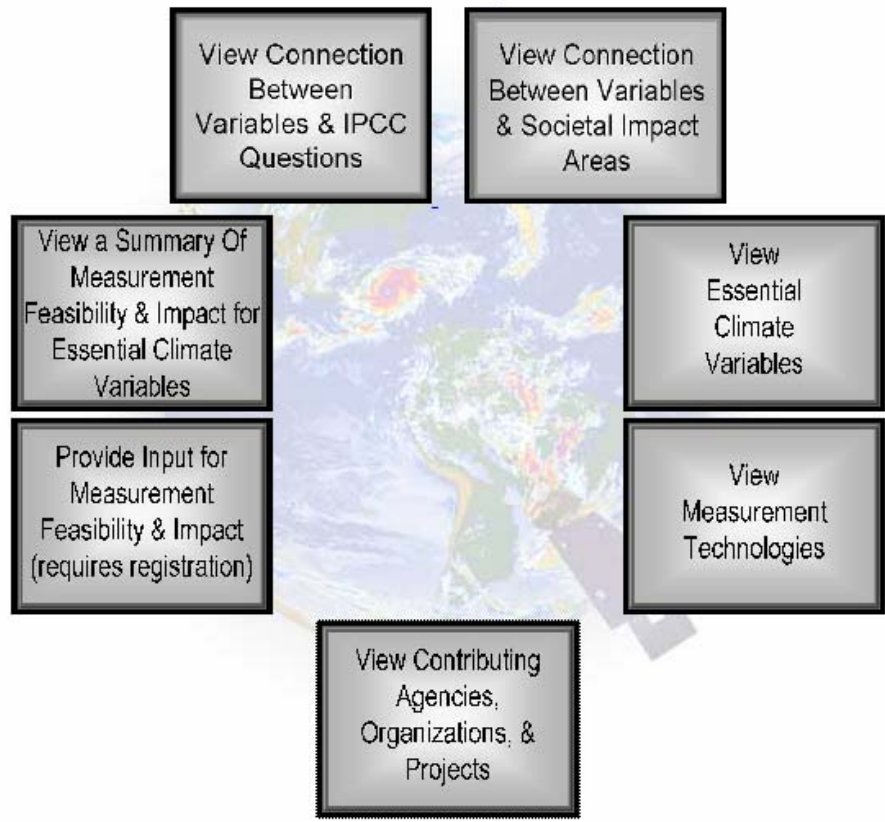
Click on NAV map below for rapid navigation:

# Scientific Data Stewardship

ver. 2.0  
(Active Database Mode)



## Essential Climate Variables - Change and Measurement Choices



Click one of the boxes above to enter the web site.





<b>Impact Legend</b>	<b>Domain Legend</b>
<b>S</b> = Strong (2.5-3.0)	☐ = Atmosphere
<b>M</b> = Medium (1.5-2.4)	☐ = Oceans/Ice
<b>W</b> = Weak (0.5-1.4)	☐ = Terrestrial

## ECV Societal Benefit Matrix

GEO Work Plan 2007-2009 tasks and societal related Essential Climate Variables (ECV's) are as follows:  
(Active Database Mode)



ECVs:		SOCIETAL IMPACT ISSUES:						TOTALS:	
ID:	Essential Climate Variables ECV Domain	AGRICULTURE	BIODIVERSITY	CLIMATE	DISASTER	ECOSYSTEMS	ENERGY	Societal Totals	Societal Averages

1	Ozone Concentration [O3]	N/A	N/A	S	N/A	N/A	M	5.0	1.667
2	Total Solar Irradiance (TSI)	N/A	N/A	S	N/A	N/A	N/A	8.0	2.667
3	Solar Irradiance, Spectral	N/A	N/A	S	N/A	N/A	S	8.0	2.667
4	Earth Radiation Budget (including solar ir...)	N/A	N/A	S	N/A	N/A	S	9.0	2.667
5	Cloud Properties	S	N/A	S	N/A	N/A	S	12.0	3.0
6	Radiation Budget Earth Surface (SW and LW)	S	N/A	S	N/A	N/A	S	12.0	3.0
7	Albedo (Surface)	S	N/A	S	N/A	N/A	S	12.0	3.0
8	Sea Level (Surface topography)	N/A	N/A	S	S	N/A	N/A	6.0	3.0
9	Aerosol Concentration and Properties (Stra...)	N/A	N/A	S	N/A	N/A	S	12.0	3.0
10	Snow Cover	N/A	N/A	S	M	N/A	M	10.0	2.5
11	Glaciers and ice caps	N/A	N/A	S	M	N/A	M	10.0	2.5
12	Ice, Sheets	N/A	N/A	S	M	N/A	M	10.0	2.5
13	Lake Levels	N/A	N/A	S	N/A	N/A	M	8.0	2.667



## New sensors – monitoring of CH<sub>4</sub>, CO, CO<sub>2</sub>



- PostEPS planning at User Application Group level considered requirements on chemistry monitoring beyond 2020.
- Variables considered were O<sub>3</sub>, H<sub>2</sub>O, CH<sub>4</sub>, CO<sub>2</sub>, CO and NO<sub>2</sub> profiles.
- Highest impact would have high resolution infrared (IRS) and SWIR (UVNS) sounding.
- In the current mission ranking for PostEPS gives very high priority for IRS (IASI follow on) and medium priority for UVNS.
- Planning of PostEPS is connected to ESA plans for GMES sentinels 4 and 5, i.e., funding may come from EU rather than EUMETSAT member states.





# GSICS



- Current contributors: CMA, CNES, EUMETSAT, JMA, KMA, NASA, NIST, NOAA
- Routine LEO to LEO intercalibration , results in “science pages” :
  - [www.star.nesdis.noaa.gov/smcd/spb/calibration/icvs/GSICS/](http://www.star.nesdis.noaa.gov/smcd/spb/calibration/icvs/GSICS/)
- GEO-LEO intercalibration should be operational in 2008 using METOP/IASI as reference through common tools and procedures
- Data management issues being addressed
- Open question about need to have identical calibration algorithms

# Implementation

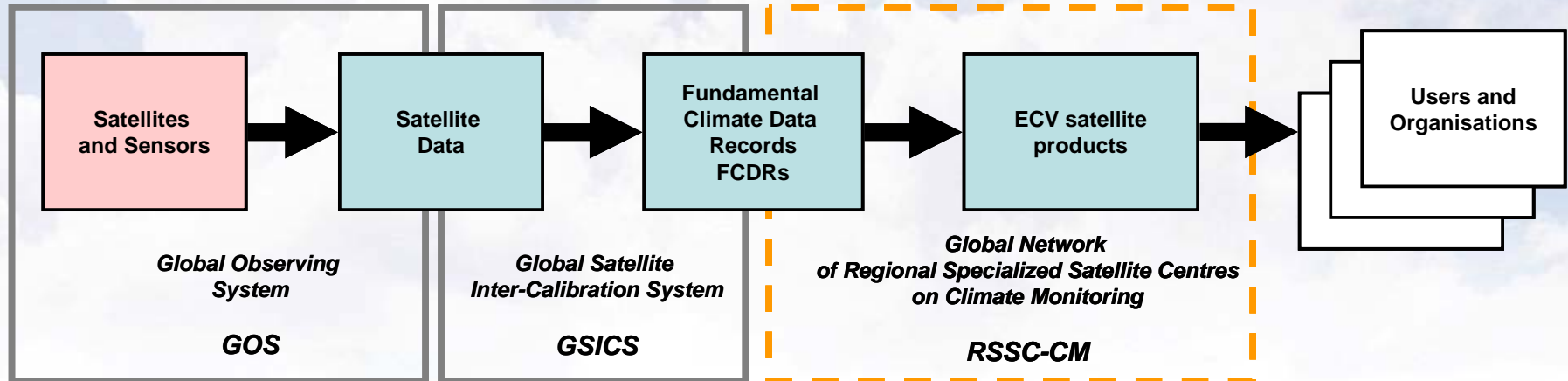
Overall objective: Continuous and sustained provision of high-quality Essential Climate Variables satellite products on a global scale (includes reprocessing)

## The R/SSC-CM (Regional/Specialised Satellite Center-Climate Monitoring) Network will be:

Based on activities of **existing initiatives** (GOS, GCOS and GSICS)

Build upon existing operational infrastructures

Serve users and other organisations (e.g. WMO Regional Climate Centres RCC, National Weather Services)





# R/SSC Initial Candidates (highest maturity & long time period)



- Cloud properties + aerosols
  - NOAA(proposal coordinator) + EUMETSAT (CM-SAF)
    - (may include Polar Winds and surface properties)
- SSM/I: total column water vapour, precipitation, liquid water path
  - NOAA + EUMETSAT (CM-SAF) (proposal coordinator) + CMA(precipitation)
    - (may include snow and sea ice)
- Surface albedo, clouds + aerosols from geostationary satellites
  - JMA + EUMETSAT (CF + CM SAF) (proposal coordinator) + NOAA + CMA
- Atmospheric Motion Vectors (AMV) + clear sky radiance
  - JMA + EUMETSAT (CF) (proposal coordinator) + NOAA + CMA
- Upper tropospheric humidity
  - JMA + EUMETSAT (CF + CM SAF) + NOAA (proposal coordinator) + CMA



# Suggested Topics for WG meeting



- Review recent advances in (A)TOVS climate datasets including errors in (A)TOVS climate datasets
- Current and future work on intercalibration of HIRS and MSU/AMSU sensors including MSU/AMSU temperature, HIRS water vapor, HIRS ozone, AMSU-B 183GHz
- Plans for hyperspectral instruments, including archiving and products as well as climate studies
- Plans for SSM/T2 and SSMIS
- Need of long term calibration standards – GRUAN/CLARREO for climate
- Stratospheric climate change
- Clouds including status of assessment and future activities
- Carbon Dioxide and Dust (LMD)
- GSICS and R/SSC-CM: A future framework for transition of research products into sustainable production of climate data records?